



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
Southeast Fisheries Science Center  
Galveston Laboratory  
4700 Avenue U  
Galveston, Texas 77551-5997  
409-766-3500 (voice) 409-766-3508 (fax)  
<http://galveston.ssp.nmfs.gov/galv>



June 22, 2005

To All Concerned:

**FORECAST FOR THE 2005 BROWN SHRIMP SEASON IN THE WESTERN GULF OF MEXICO,  
FROM THE MISSISSIPPI RIVER TO THE U.S. - MEXICO BORDER.**

Prediction Summary

Scientists at the National Marine Fisheries Service (NOAA Fisheries) Southeast Fisheries Science Center's Galveston Laboratory have prepared the following information on prospects for the 2005 brown shrimp season (July 2005 – June 2006) in the western Gulf of Mexico. Data obtained from NOAA Fisheries Galveston Laboratory, NOAA port agents, National Climatic Data and Weather Centers, Louisiana Department of Wildlife and Fisheries, Texas Parks and Wildlife Department, and the commercial shrimp industry contribute to this forecast. Juvenile brown shrimp abundance and growth estimates are obtained by monitoring the inshore commercial shrimp fisheries in Texas and the inshore and nearshore fisheries in Louisiana. In addition, environmental variables are measured to assess the favorability of conditions in habitat for growth and survival of young shrimp. Collectively, these indices provide an estimate of inshore stock strength prior to shrimp movement into the offshore fishery.

The Texas and Louisiana 2005 abundance models suggest a below average year of brown shrimp production for the western Gulf of Mexico; however, increasing catch rates and size composition data in mid-June (the end of our monitoring surveys) indicate continued recruitment not reflected in our models. Moreover, reports of low fishing effort in May, due to increased fuel prices, may have influenced our predicting capabilities with respect to the Louisiana model. The Galveston Bay bait index forecasts a below average year at 23.3 million pounds from offshore Texas waters from July 2005 through June 2006. Similarly, 2005 Louisiana indices suggest a below average yield of approximately 21.0 million pounds of brown shrimp this season from west of the Mississippi River to the Texas-Louisiana border. Overall, the western Gulf of Mexico could expect, at minimum, annual brown shrimp production of approximately 44.3 million pounds during the 2005-2006 season. This is below the 1960-2003 historical average of 56.8 million pounds for the two-state area.

Environmental conditions in late winter and early spring 2005 delayed the recruitment of brown shrimp this year by at least three weeks as evidenced by our monitoring. Normally, postlarval brown shrimp begin entering estuaries in Texas and western Louisiana in mid-February and continue through July. Several waves of postlarvae may enter with peak recruitment from February through early April. Environmental conditions and biological factors affect the survival and growth of young shrimp that enter the estuaries. Three environmental variables, temperature, salinity and water height, have been correlated with subsequent shrimp production. Optimal shrimp growth has been documented in waters of greater than 68° F. Favorable nursery area appears to be related to the distribution of high salinity waters as well as water height in interior marshes.

This year, air temperatures in late winter and early spring were mild (Table 1), with the exception of two weather fronts in early-February and mid-March. Each of these fronts occurred during the peak recruitment phase and lasted several days. The fronts brought record low temperatures and low tides in coastal areas of the western Gulf of Mexico that most likely delayed recruitment. Also, rainfall this spring has been below normal for coastal areas of Texas and western Louisiana (Table 1), resulting in higher salinities (Table 2). Collectively, these higher salinities and above normal tidal height in marshes (Table 3) have increased the amount of favorable habitat for brown shrimp entering estuarine estuaries.



### Environmental Model

The Environmental Model is used to predict the annual harvest related to the historical production. The model uses Galveston air temperature during mid-April (the key component), rainfall during early March, and bay water height during late April and early May. These components are additive in the model, thus higher values indicate higher catch. Temperature, rainfall and water height values were above average this year (Table 3), and suggest above average production off Texas as related to environmental conditions conducive for optimal shrimp growth and survival.

### Catch-per-Unit-Effort in the Inshore Texas Fishery

Texas bay commercial brown shrimp catch rates (heads-on; pounds per hour) and size composition data for May 2005 were obtained from NOAA Fisheries port agents. However, we note that catch rates recorded this spring may not adequately portray brown shrimp catch-per-unit effort due to low shrimping effort in some Texas bays. Smaller than average shrimp, low dockside prices and high fuel costs were cited as reasons for the decrease in effort. Based on the data available, all Texas bays with the exception of San Antonio Bay experienced at or below average catch rates as compared to the historical average (Table 4). Galveston Bay experienced the lowest catch-per-unit effort as compared to the 1986 through 2004 historical average, with brown shrimp dominating the catch composition in late May and early June, later than seen in previous years. Small shrimp (i.e., 81-100) dominated the catch in San Antonio and Aransas Bays. The dominant size categories in Corpus Christi and Galveston Bays were 71-80, and Matagorda Bay had 61-70 count per pound shrimp.

### Baxter Bait Index

For the past 45 years, our most reliable estimate of subsequent brown shrimp production off the Texas coast comes from monitoring the Galveston Bay bait shrimp fishery during late April through mid-June (Baxter Bait Index; Table 5). Strong recruitment into the commercial bait fishery was approximately three weeks late as compared to the historical trend. Catch-per-unit-effort was still increasing during the last week of the survey (second week of June), suggesting continued recruitment into the fishery. High salinities prevailed throughout most of Galveston Bay during spring increasing available nursery area for optimal shrimp growth and survival. Using the bait versus offshore landings regression model (1981 - 2004), a value of 23.3 million pounds is forecast for 2005 production in Texas offshore waters. This value is 3.0 million pounds below the long-term (1960 - 2003) average catch of 26.3 million pounds.

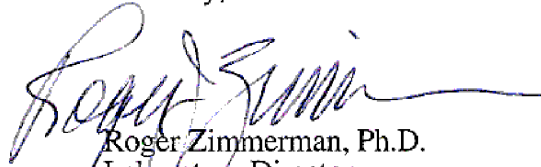
### Louisiana Inshore - Offshore Production

Catch information from Louisiana inshore and offshore fisheries in May is used to estimate total production for the biological year from May through April (Table 6). Using May 2005 brown shrimp catch (4.1 million pounds) in our Louisiana model, we predict a harvest of 21.0 million pounds for Louisiana west of the Mississippi River for the 2005-2006 season. This is well below the historical average of 30.5 million pounds. Louisiana Department of Wildlife and Fisheries scientists estimated that 0.91 million acres of marsh with salinities greater than 10 ppt were available this year for brown shrimp, an increase of approximately 0.17 million acres as compared to this time last year. The brown shrimp recruitment delay and increased fuel prices resulting in lower May fishing effort may have affected our ability to accurately forecast Louisiana brown shrimp production this year.

### Forecast Summary

Based on 2005 brown shrimp forecast models, brown shrimp production off Texas and Louisiana is estimated to be below average for the 2005-2006 season. However, increasing brown shrimp recruitment at the end of our monitoring surveys, combined with favorable environmental conditions suggest that brown shrimp yields have the potential to be above our model's predicted values. If you would like more information regarding this forecast, or for other marine fishery information, please contact us at 409-766-3500, or visit our web site at <<http://galveston.ssp.nmfs.gov/galv>>.

Sincerely,



Roger Zimmerman, Ph.D.  
Laboratory Director

attachments

Table 1. Rainfall and air temperature during 2005 for selected areas. Source: NOAA, National Climatic Data Center and National Weather Service, June 14, 2005.

	Year-to-Date Rainfall (Inches)	Rainfall (Inches Above/ Below Historical)	Departure: Above or Below Historical Monthly Average Air Temperature (°F) and Precipitation (inches)							
			JAN		FEB		MAR		APR	
			Temperature	Rainfall	Temperature	Rainfall	Temperature	Rainfall	Temperature	Rainfall
<b>TEXAS</b>										
Brownsville	3	-6	7	-1	4	0	1	-1	0	-2
Corpus Christi	9	-3	5	-1	3	1	0	1	1	-2
Houston	21	0	5	0	3	3	-1	1	-1	-2
Port Arthur	14	-12	5	-3	3	1	-1	-1	-1	-3
<b>LOUISIANA</b>										
Lake Charles	20	-5	6	0	3	2	-1	-1	0	-3
New Orleans	25	-4	5	-1	4	3	-2	-1	0	-2

Table 2. Salinities and water temperatures in West Galveston Bay during April and May, 1982-2005. Source for salinity and temperature data 1997-2005: Texas Parks and Wildlife Department.

Year	Offshore Catch (Millions of Pounds)	Salinity (PPT)			Water Temperature (°F)		
			APR	MAY		APR	MAY
1982	21.8		24	20		76	77
1983	18.2		24	28		66	74
1984	24.1		28	32		78	82
1985	30.4		21	25		79	82
1986	27.1		27	28		75	78
1987	27.2		32	31		84	79
1988	22.5		25	25		78	79
1989	30.3		26	25		77	83
1990	33.4		15	18		NA	84
1991	32.8		15	15		74	81
1992	24.6		15	21		73	82
1993	21.1		20	19		73	74
1994	25.5		21	20		78	79
1995	23.5		18	19		70	78
1996	22.3		30	29		77	81
1997	17.0		13	16		70	78
1998	27.0		22	30		71	86
1999	22.0		28	28		82	86
2000	31.1		31	29		81	82
2001	24.6		17	24		74	81
2002	21.2		21	24		75	82
2003	23.2		23	21		71	80
2004	21.8*		14	10		72	77
2005			23	28		73	75

\*Estimated

Table 3. Environmental Model prediction of the trend in catch of Texas brown shrimp offshore production (July-June).

Year	Direction of Prediction Relative to Average	Air Temperature	Rainfall	Water Height	Offshore Catch (Millions of Pounds)
1990	+	68.3	0.8	5.7	33.4
1991	+	73.2	0.1	5.9	32.8
1992	-	66.6	0.5	4.9	24.6
1993	-	66.9	0.9	5.4	21.1
1994	+	71.2	1.3	5.6	25.5
1995	+	72.7	1.1	5.4	23.5
1996	-	70.3	0.7	4.9	22.3
1997	+	68.3	0.4	5.5	17.0
1998	-	68.5	0.5	5.1	27.0
1999	+	70.8	0.2	5.3	22.0
2000	+	70.3	0.1	5.4	31.1
2001	+	74.3	0.5	5.2	24.6
2002	+	74.1	1.2	6.2	21.2
2003	+	68.9	0.2	5.5	23.2
2004	+	69.1	0.2	5.1	21.8*
2005	+	72.9	1.7	6.1	

Table 4. Estimated average May inshore commercial shrimp catch in pounds per hour (heads-on) for selected Texas Bays, 1986-2005.

Year	Selected Texas Bay Systems Pounds/Hour (heads-on)					Offshore Catch (Millions of Pounds)
	San Antonio	Corpus Christi	Aransas	Matagorda	Galveston	
1986	40	20	40	40	48	27.1
1987	45	20	41	45	50	27.2
1988	75	38	46	33	45	22.5
1989	29	25	26	18	31	30.3
1990	64	54	62	55	63	33.4
1991	41	38	56	31	23	32.8
1992	14	25	19	12	23	24.6
1993	44	32	28	32	28	21.1
1994	53	50	54	51	32	25.5
1995	38	45	38		22	23.5
1996	40	32	43	30	18	22.3
1997	35	48	52	25	31	17.0
1998	56	48	37	37	26	27.0
1999	47	32	35	34	33	22.0
2000	45	32	29	32	42	31.1
2001	60	45	35	60	34	24.6
2002	44	35	38	19	16	21.2
2003	43	35	53	32	26	23.2
2004	NE	31	9	45	19	21.8*
<b>Historical Average</b>	<b>45</b>	<b>36</b>	<b>39</b>	<b>35</b>	<b>32</b>	
2005	53	36	30	33	9	
Dominant Count	81-100; 71-80	71-80	81-100	61-70	71-80; 81-100	

\*Estimated

NE - No quantifiable effort.

Table 5. Texas offshore brown shrimp catch predictions (millions of pounds) based on Galveston Bay bait index values. Average catch (July-June) from 1960-2003 was 26.3 million pounds.

Year	Predicted Catch	Actual Catch	Difference
1960	29.1	34.5	5.4
1961	20.0	13.2	-6.8
1962	21.5	17.3	-4.2
1963	29.0	24.6	-4.4
1964	22.6	18.6	-4.0
1965	25.6	26.4	0.8
1966	-	31.5	-
1967	39.0	42.7	3.7
1968	22.0	27.9	5.9
1969	26.3	24.7	-1.6
1970	33.7	30.7	-3.0
1971	37.1	34.4	-2.7
1972	38.0	35.5	-2.5
1973	19.4	23.3	3.9
1974	23.8	26.4	2.6
1975	-	23.7	-
1976	23.8	25.7	1.9
1977	30.5	34.4	3.9
1978	25.5	27.7	2.2
1979	-	16.5	-
1980	26.7	26.2	-0.5
1981	29.3	41.5	12.2
1982	21.5	21.8	0.3
1983	17.8	18.2	0.4
1984	22.9	24.1	1.2
1985	29.0	30.4	1.4
1986	25.3	27.1	1.8
1987	25.7	27.2	1.5
1988	25.9	22.5	-3.4
1989	23.1	30.3	7.2
1990	-	33.4	-
1991	23.1	32.8	9.7
1992	24.1	24.6	0.5
1993	26.8	21.1	-5.7
1994	27.1	25.5	-1.6
1995	29.1	23.5	-5.6
1996	25.1	22.3	-2.8
1997	28.2	17.0	-11.2
1998	25.8	27.0	1.2
1999	24.5	22.0	-2.5
2000	30.0	31.1	1.1
2001	23.7	24.6	0.9
2002	26.6	21.2	-5.4
2003	21.6	23.2	1.6
2004	22.5	21.8*	-0.7
2005	23.3		

\*Estimated

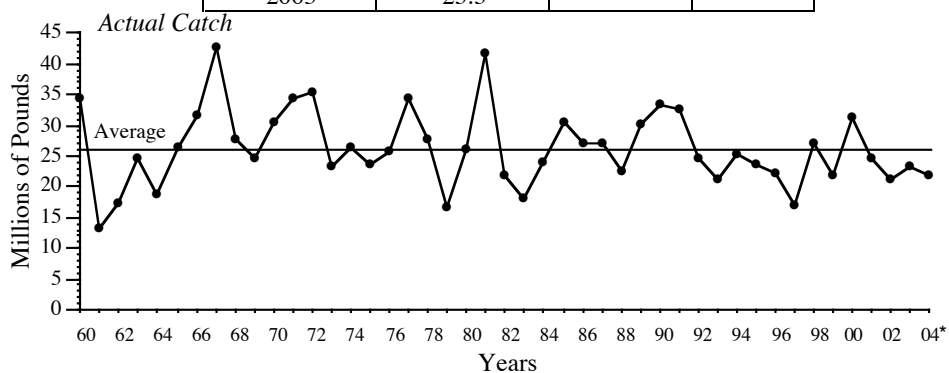


Table 6. Louisiana inshore and offshore brown shrimp prediction (millions of pounds) based on May catch index values. Average catch (May - April) from 1960-2003 was 30.5 million pounds. Acreage with salinities greater than 10 ppt is in millions of acres.

Year	Predicted Catch	Actual Catch	Difference	Acreage > 10 ppt
1960		16.0		
1961		9.1		
1962		7.3		
1963		16.9		
1964		9.6		
1965		17.7		
1966		18.7		
1967		29.5		2.30
1968		25.4		1.90
1969		25.2		1.60
1970		28.1		2.10
1971		30.7		1.90
1972		32.2		1.80
1973		17.9		1.00
1974		20.6		1.20
1975		18.1		1.30
1976		37.5		1.60
1977		49.1		1.80
1978		45.9		1.50
1979		36.7		1.20
1980		23.8		0.50
1981		44.3		2.80
1982		33.0		1.50
1983		24.9		0.90
1984		33.3		1.60
1985	40.3	33.7	-6.6	1.75
1986	50.0	44.1	-5.9	2.50
1987	32.9	40.0	7.1	1.50
1988	30.2	34.3	4.1	1.35
1989	43.7	37.6	-6.1	1.75
1990	60.0	45.9	-14.1	1.20
1991	35.4	32.0	-3.4	1.00
1992	26.3	28.2	1.9	1.55
1993	-	27.7	-	0.80
1994	31.7	24.6	-7.1	1.20
1995	36.5	31.7	-4.8	1.60
1996	31.8	35.3	3.5	1.85
1997	25.5	29.3	3.8	1.00
1998	40.3	34.2	-6.1	1.40
1999	45.0	42.7	-2.3	1.79
2000	47.1	43.9	-3.2	2.48
2001	62.4	42.1	-20.3	1.66
2002	39.0	36.3	-2.7	1.50
2003	42.0	45.0	3.0	1.35
2004	41.2	39.1*	-2.1	0.74
2005	21.0			0.91

\*Estimated

